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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,593	10/24/2003	Richard L. Sutherland	SAIC0003-C3-C	7316
27510	7590	11/17/2004	EXAMINER	
KILPATRICK STOCKTON LLP 607 14TH STREET, N.W. WASHINGTON, DC 20005			ANGEBRANDT, MARTIN J	
			ART UNIT	PAPER NUMBER
			1756	

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/691,593

Applicant(s)

SUTHERLAND ET AL.

Examiner

Martin J Angebrannt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 50-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 50-61 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

1. The response of the applicant has been read and given careful consideration. Responses to the arguments are presented after the first rejection to which they are directed. Rejections of the previous office action not found below are withdrawn based upon the amendments to the claims and the corresponding arguments. The examiner notes that Sutherland et al. '343 discloses slant fringe transmission holograms, (see figure 11a of the instant specification) not slant fringe reflection holograms (see figure 11b of the instant specification)

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 50,51,53,54 and 57-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sutherland et al. Chem. Mater. Vol 5, pages 1533-1538, (1993) and Tanaka et al. '452.

Sutherland et al., 'Bragg Gratings in an acrylate polymer consisting of periodic polymer dispersed liquid crystal planes' Chem. Mater. Vol 5, pages 1533-1538, (1993) in the example uses the monomer dipentaerythritol hydroxypentacrylate, 10-30 wt% of the nematic liquid crystal E7, 10 wt % of the crosslinking monomer N-vinylpyrrolidone, millimolar amounts of the coinitiator N-phenyl glycine and millimolar amounts of the photoinitiator Rose Bengal which is then exposure using a Argon ion laser. (1534/left column). The grating spacings are 0.54 microns. The clearing of the holograms using heat or electrical fields is disclosed. (1535/left column). The procedure for recording holograms in the medium where the LC is in the photosensitive composition allows fast single step recording with high diffraction efficiencies

(page 1533, lower right column to page 1534, upper left column). The formation of reflection filters is disclosed. (page 1553, right hand column)

Tanaka et al. '452 teaches the use of nematic LC based PDLC material for making holographic articles. See figures 10-15b, 16c, 18-22, 25 and particularly figures 31-33, 39 and 42a-42b, multiplexed holograms in figures 45-48. The use of the LC mixture E-7 is disclosed with respect to figure 10 which uses an ITO film to facilitate switching (15/20). Tanaka et al. '452 shows in figures 10-15b and 18-22, that the fringes of holographic lenses are at an angle to the surfaces of the hologram.

It would have been obvious to one skilled in the art to modify the process of Sutherland et al. Chem. Mater. Vol 5, pages 1533-1538, (1993) by using the material to record other useful holographic articles, such as the slant fringe holograms shown in figures 42a-42b or the angularly multiplexed holograms disclosed by Tanaka et al. '452 in figures 45-48 with a reasonable expectation of forming useful PDLC holographic articles and in the case of the angularly multiplexed holograms increasing the information content of the holograms beyond that of a single holographic image. Additionally, it would have been obvious to one skilled in the art to modify the teachings of Tanaka et al. '452 by forming the PDLC holograms shown in figures figures 42a-42b or the angularly multiplexed holograms of figures 45-48 using the fast (highly sensitive) PDLC recording material taught by Sutherland et al. Chem. Mater. Vol 5, pages 1533-1538, (1993) with a reasonable expectation of forming useful PDLC holographic articles

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on

combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The examiner notes that the formation of reflection grating filters is disclosed on page 1533 and the formation of either transmission holograms and reflection holograms is disclosed in Tanaka et al. '452 (see figures 6 and 7) and establishes the desirability/utility of either. The examiner holds that the desirable properties of the PDLCs of Sutherland et al. Chem. Mater. Vol 5, pages 1533-1538, (1993) including fast single step recording with high diffraction efficiencies renders the medium from which any advantages flow as a desirable recording medium for any switchable hologram. The rejection stands.

4. Claims 50,51,53,54 and 57-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sutherland et al. Appl. Phys. Lett., Vol 64(9) pp 1074-1076 (2/1994) and Tanaka et al. '452.

Sutherland et al., 'Electrically switchable volume gratings in polymer-dispersed liquid crystals', Appl. Phys. Lett., Vol 64(9) pp 1074-1076 (2/1994) in the example uses the monomer dipentaerythritol hydroxypentacrylate, 10-40 wt% of the liquid crystal E7, the crosslinking monomer N-vinylpyrrolidone, the coinitiator N-phenyl glycine and the photoinitiator Rose Bengal which is then exposure using a Argon ion laser when coated between ITO coated slides. (1074/right column). The material is disclosed as having a fast curing speed, which results in small LC droplets (page 1074, right column). The process is also single step and allows the formation of any switchable grating (page 1074. left column). When the field is applied, the nematic directors are oriented normal (perpendicular) to the surface of the film, which makes this a reflection hologram (page 1076,upper left column).

It would have been obvious to one skilled in the art to modify the process of Sutherland et al. Appl. Phys. Lett., Vol 64(9) pp 1074-1076 (2/1994) by using the material to record other useful holographic articles, such as the slant fringe holograms shown in figures 42a-42b or the angularly multiplexed holograms disclosed by Tanaka et al. '452 in figures 45-48 with a reasonable expectation of forming useful PDLC holographic articles and in the case of the angularly multiplexed holograms increasing the information content of the holograms beyond that of a single holographic image. Additionally, it would have been obvious to one skilled in the art to modify the teachings of Tanaka et al. '452 by forming the PDLC holograms shown in figures figures 42a-42b or the angularly multiplexed holograms of figures 45-48 using the fast (highly sensitive) PDLC recording material taught by Sutherland et al. Appl. Phys. Lett., Vol 64(9) pp 1074-1076 (2/1994) with a reasonable expectation of forming useful PDLC holographic articles

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The examiner notes that the formation of reflection grating filters is disclosed on page 1533 and the formation of either transmission holograms and reflection holograms is disclosed in Tanaka et al. '452 (see figures 6 and 7) and establishes the desirability/utility of either. The examiner holds that the desirable properties of the PDLCs of Sutherland et al. Appl. Phys. Lett., Vol 64(9) pp 1074-1076 (2/1994) including fast curing speed, which results in small LC droplets and the ability to form these in a single step process which allows the formation of any switchable grating renders the medium

from which any advantages flow as a desirable recording medium for any switchable hologram. Additionally in Sutherland, when the field is applied, the nematic directors are oriented normal (perpendicular) to the surface of the film, which makes this a reflection hologram (page 1076, upper left column). The rejection stands.

5. Claims 50-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sutherland et al., 'Development of photopolymer-liquid crystal composite materials for dynamic hologram applications', SPIE vol. 2152, pp. 303-313 (1994) and Tanaka et al. '452.

Sutherland et al. SPIE vol. 2152, pp. 303-313 teaches 10-40 wt % of liquid crystal E7, 10 wt% n-vinylpyrrolidone, millimolar ranges of N-phenyl glycine, 10^{-4} M Rose Bengal and the balance being dipentaerythritol hydroxypentaacrylate and 8% ocatnoic acrid as a surfactant coated between two ITO slides and gratings were recorded in the resulting compositions.. (section 2 materials) Examples include loading of the LC E7 at 16, 16.5, 21, 24, 29, 34 and 36 wt% are presented in the reference. The use of these to form various switchable holographic articles including interconnects, angular multiplexers, and multifocal lenses is disclosed. (page 303). The materials are inexpensive and offers commercial potential. (page 311).

It would have been obvious to one skilled in the art to modify the process of Sutherland et al. SPIE vol. 2152, pp. 303-313 by using the material to record other useful holographic articles, such as the slant fringe holograms shown in figures 42a-42b or the angularly multiplexed holograms disclosed by Tanaka et al. '452 in figures 45-48 with a reasonable expectation of forming useful PDLC holographic articles and in the case of the angularly multiplexed holograms increasing the information content of the holograms beyond that of a single holographic image. Additionally, it would have been obvious to one skilled in the art to

modify the teachings of Tanaka et al. '452 by forming the PDLC holograms shown in figures 42a-42b or the angularly multiplexed holograms of figures 45-48 using the fast (highly sensitive) PDLC recording material taught by Sutherland et al. SPIE vol. 2152, pp. 303-313 to form articles specifically considered by Sutherland et al. SPIE vol. 2152, pp. 303-313 with a reasonable expectation of forming useful PDLC holographic articles

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The examiner notes that the formation of reflection grating filters is disclosed on page 1533 and the formation of either transmission holograms and reflection holograms is disclosed in Tanaka et al. '452 (see figures 6 and 7) and establishes the desirability/utility of either. The examiner holds that the desirable properties of the PDLCs of Sutherland et al. SPIE vol. 2152 including low cost and commercial applicability renders the medium from which any advantages flow as a desirable recording medium for any switchable hologram.

6. Claims 50-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sutherland et al., 'Switchable holograms in new photopolymer-liquid crystal composite materials', SPIE vol. 2404, pp. 132-143 (2/1995) and Tanaka et al. '452.

Sutherland et al. SPIE vol. 2404, pp. 132-143 teaches dipentaerythritol hydroxypentaacrylate, liquid crystal E7, n-vinylpyrrolidone, N-phenyl glycine, Rose Bengal, and 4-8% octanoic acid coated between two ITO slides and gratings were recorded in the resulting compositions.. (section 2 experiment) Examples include loading of the LC E7 at 27%

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and the surfactant at 4% (page 137,138) are presented in the reference. The use of these to form various switchable holographic articles including interconnects, angular multiplexers, and multifocal lenses is disclosed. (page 132). The materials are extremely sensitive to light (fast, page 133) and high switching speeds are achieved. (page 132)

It would have been obvious to one skilled in the art to modify the process of Sutherland et al. SPIE vol. 2404, pp. 132-143 by using the material to record other useful holographic articles, such as the slant fringe holograms shown in figures 42a-42b or the angularly multiplexed holograms disclosed by Tanaka et al. '452 in figures 45-48 with a reasonable expectation of forming useful PDLC holographic articles and in the case of the angularly multiplexed holograms increasing the information content of the holograms beyond that of a single holographic image. Additionally, it would have been obvious to one skilled in the art to modify the teachings of Tanaka et al. '452 by forming the PDLC holograms shown in figures 42a-42b or the angularly multiplexed holograms of figures 45-48 using the fast (highly sensitive) PDLC recording material taught by Sutherland et al. SPIE vol. 2404, pp. 132-143 to form articles specifically considered by Sutherland et al. SPIE vol. 2404, pp. 132-143 with a reasonable expectation of forming useful PDLC holographic articles.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The examiner notes that the formation of reflection grating filters is disclosed on page 1533 and the formation of either transmission holograms and reflection holograms is disclosed in Tanaka et al. '452 (see figures 6

and 7) and establishes the desirability/utility of either. The examiner holds that the desirable properties of the PDLCs of Sutherland et al. SPIE vol. 2404 including are extremely sensitive to light (fast, page 133) and high switching speeds are achieved. (page 132) render the medium from which any advantages flow as a desirable recording medium for any switchable hologram.

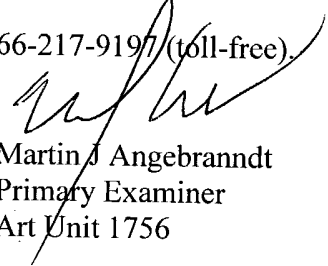
7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebranndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Martin J. Angebranndt
Primary Examiner
Art Unit 1756

11/12/2004